

SECTION 02950

TREES, PLANTS, AND GROUND COVER

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Preparation of planting mix.
- B. New trees, plants, and ground cover.
- C. Mulch and fertilizer.
- D. Maintenance.
- E. Tree Pruning.

1.2 SUBMITTALS

- A. Submit the following in accordance with the requirements of Sections 01300:
 - 1. Certifications of manufacturer's or vendor's certified analysis for soil amendments and fertilizer materials. Submit data as necessary to substantiate that materials comply with specified requirements.
 - 2. Installation Instructions, including planting schedule dates and type of work to be performed. Correlate to provide specified maintenance periods. Once schedule is accepted, document reasons for delays or changes and revise dates only as approved by LANL.
 - 3. Materials list of tree sources for LANL approval prior to ordering tree materials. Indicate source name, address, telephone number, quantity and species of trees to be ordered from source.
 - 4. Samples, if bark mulch is required. Submit 1 cubic foot of mulch for LANL approval prior to ordering mulch.
 - 5. Record drawings noting any variations from the plans. Submit 2 copies of record "As-Built" prints prior to expiration of the required maintenance period.

1.3 QUALITY ASSURANCE

A. Contractor Qualifications

Perform work by a single firm with a licensed Landscape Contractor experienced with the type and scale of work required and having equipment and personnel adequate to perform the work satisfactorily.

B. Material Quality Controls:

- 1. Ship landscape materials with certificates of inspection required by industry and/or government regulations. Comply with regulations applicable to landscape materials.
- 2. Package standard products with manufacturer's certified analysis. For other materials, provide analysis by a recognized testing laboratory made in accordance with methods established by the Association of Official Agricultural Chemists, wherever applicable.

3. Label each tree, shrub and ground cover with securely attached water proof tag bearing legible designation of botanical and common name.
4. LANL will approve sources of deciduous and evergreen trees prior to ordering by contractor.
5. LANL will inspect or tag trees, shrubs and ground covers either at place of growth or at site before planting, for compliance with requirements for genus, species, variety, size and quality. LANL retains the right to further inspect plant material for size and condition of balls and root systems, insects, injuries and latent defects, and to reject unsatisfactory or defective material at any time during progress of work.

1.4 DELIVERY, STORAGE AND HANDLING

A. Delivery/Storage of Materials:

1. Deliver packaged materials in containers showing weight, analysis and name of manufacturer. Protect materials from deterioration during delivery and while stored at site.
2. Do not prune trees and shrubs prior to delivery. Do not bend or bind-tie trees or shrubs in such manner as to damage bark, break branches or destroy natural shape. Provide protective covering during transport to site. If deciduous trees or shrubs are moved in full leaf, spray with anti-desiccant at nursery before moving and again 2 weeks after planting. Do not drop stock during delivery. Do not remove boxed or container-grown stock from containers until planting time.
3. Delivery trees and shrubs after preparations for planting have been completed and can be planted immediately. If planting is delayed more than 6 hours after delivery, set trees and shrubs in shade, protect from weather and mechanical damage and keep roots moist.

B. Handling During Planting:

1. Lift trees only by methods that will not damage bark or loosen trunk from rootball or otherwise damage the appearance, health or growth of the tree.
2. Handle shrubs and ground covers by containers, do not carry by foliage or branches. Do not drop or damage material during moving.

1.5 ENVIRONMENTAL REQUIREMENTS

- A. Do not install plant life when ambient temperatures may drop below 35 degrees F or rise above 90 degrees F.
- B. Proceed with and complete landscape work as rapidly as portions of site become available, working within seasonal limitations for each kind of landscape work required. Assess if site is ready for work to begin.
- C. Determine the acceptability of subgrade preparation prior to the start of landscaping work. Protect existing items to remain and new work of other trades to ensure proper timing of each phase of work.
- D. Do not plant when conditions detrimental to plant growth are encountered, such as rubble fill, adverse drainage conditions, or obstructions.
- E. Plant or install materials during period identified on the submitted planting schedule.

- F. Coordinate plant locations with the location of irrigation heads. When a discrepancy is found between the irrigation system layout and the planting layout, notify LANL inspector immediately and do not proceed with further work in that area until notified by LANL inspector.
- G. Plant trees and shrubs after final grades are established and prior to planting of lawns, unless otherwise acceptable to LANL. If planting of trees and shrubs occurs after lawn work, protect lawn areas and promptly repair damage to lawns resulting from planting operations.

1.6 WARRANTY

- A. Warrant trees, shrubs and ground covers for a period of one full growing season after date of final acceptance against defects including death and unsatisfactory growth, unless such failure is due to LANL's negligence in following the Contractor's recommended maintenance procedure.
- B. Remove and replace trees, shrubs or other plants found to be dead or in unhealthy condition during warranty period.
- C. Replace with plants of same size and species as specified, planted in the next growing season, with a new warranty commencing on date of replacement.
- D. Another inspection will be conducted at end of extended warranty period, if any, to determine acceptance or rejection. Only one replacement will be required at end of warranty period, except for losses or replacements due to failure to comply with specified requirements.

PART 2 PRODUCTS

2.1 PLANTING/BACKFILL MIX

With exception noted below, provide a mixture of soil excavated from planting pits mixed thoroughly with organic material and sand, as follows:

- 1 part excavated soil
- 1 part sand
- 1 part organic material

Organic material from composting operations at the Los Alamos County Landfill is available free to the Contractor for hauling. If excavated soil contains materials toxic to plants, is excessively rocky or gravelly with little or no soil, or is otherwise harmful to plant growth, provide clean friable topsoil approved by LANL in place of excavated soil.

2.2 SOIL AMENDMENTS

- A. Fertilizer: Proportioned to eliminate any deficiencies of topsoil as follows:
Nitrogen [] percent, phosphoric acid [] percent, soluble potash [] percent.
- B. Organic material: Shredded, loose, free of lumps, roots, inorganic material or acidic materials.
- C. Bone Meal: Raw, finely ground, commercial grade, minimum of 3 percent nitrogen and 20 percent phosphorous.
- D. Water: Clean, fresh, and free of substances or matter which could inhibit vigorous growth of plants.

2.3 MULCH

Provide one or more of the following, as noted on the Drawings:

- A. Small Gravel Mulch: 3/8 inch coarse washed gravel, natural color (roofers/pea gravel).
- B. Large Gravel Mulch: 3/4 inch round, washed, natural color gravel.
- C. Cobble Mulch: Stones not less than 4 inches in any direction and not more than 12 inches in any direction with less than 15 percent broken fragments.
- D. Bark Mulch: Shredded or ground bark of uniform color, and free from weed seeds, sawdust and splinters. Deliver mulch in bulk quantities.

2.4 PLANT MATERIALS

- A. Provide sound, healthy specimens typical of their species, with well-formed tops and good healthy root systems. Provide materials free from injurious pests, diseases, broken branches and objectionable disfigurements. Provide nursery-grown plant materials except for native pines.
- B. Nomenclature: Conform with Standardized Plant Names and accepted botanical nomenclature in the nursery trade.
- C. Strictly adhere to the American Standards for Nursery stock unless specific approval is given for particular plant material which does not meet those specifications.
- D. Furnish plant material graded in accordance with the code of standards of the National Arborist Association (NAA). Provide plant sizes at least equal to the minimum size indicated. Remove undergrade plants and replace prior to provisional acceptance.
- E. To ensure whole sound condition of the rootball, fully wrap the balled and burlapped material with no deterioration of the wrapping fabric. Properly root prune balled and burlapped stock when dug and during cultivation.
- F. Ensure container stocks have been grown in its delivery container for not less than one year. Any root bound material will not be accepted.
- G. Do not prune plants prior to delivery. Trim specimen trees over 2 inch caliper after planting to a maximum of one-third total branch length or quantity.

2.5 TREES

Provide trees, deciduous and evergreen, well-shaped, symmetrical, full, sound, healthy specimens, with well-formed tops and healthy root systems. Provide trees that are free from injurious pests, diseases, broken branches, objectionable disfigurements, etc.

Provide trees 2 inch caliper and larger in a container or nursery grown (not collected or plantation grown) from an approved nursery. The rootball of balled and burlapped material shall be fully burlap wrapped with little deterioration of the fabric and the rootball shall be in whole sound condition. Balled and burlapped trees if wrapped with plastic burlap or plastic twine will be rejected. Use rootball supporting devices, such as wire baskets to hold the ball in firm rigid condition. Properly root prune B & B trees dug. Trees noted to be boxed shall be grown in box for a period of 2 years minimum and 4 years maximum. Any root bound material will not be accepted. Do not use trees with rootballs smaller than recommendations in ANSI Z60.1. Do not use trees which have had the main leader pruned and no replacement leader trained. Trees which have trunk abrasions or scars comprising one-third or more of the diameter of the trunk or which diminish the aesthetic quality of the tree may be rejected. Additional tree specifications listed on the Drawings are part of the criteria for tree material.

Provide nursery grown evergreen trees that have been fully transplanted at least twice during

civilization, except for locally native pines. Rootballs of field collected native pines shall be the minimum diameter ball for the next larger size nursery grown stock.

2.6 MISCELLANEOUS LANDSCAPE MATERIALS

- A. Anti-Dissicant: Emulsion type, film-forming agent designed to permit transpiration but retard excessive loss of moisture from plants. Deliver in manufacturer's fully identified containers and mix in accordance with manufacturer's instructions.
- B. Plastic sheets: Black, weather-resistant polyethylene sheeting, 0.008" (8-mils) thick.
- C. Filter Fabric: Non-woven polypropylene or polyester material in accordance with the following:

Tensile strength per ASTM D1682: 90 lbs. min. Elongation percent per ASTM D1682: 65% maximum. Equivalent open (US Sieve NO.): 50-100 Permeability coefficient (CM/SEC): 05 min. Weight in pounds per square yard: .09 min.
- D. Weed barrier: Water-permeable filtration fabric, black non-woven polyester or polypropylene, U-V light stabilized for minimum 3 years direct sunlight. Do not expose weed barrier material to sunlight in storage.
- E. Staking Materials
 - 1. Stakes: Use green steel T-bar fence posts for tree support.
 - 2. Strapping Tape: Flexible, 3 inches wide cotton strapping with finished edges.
- F. Cable, Wire, Eye Bolts and Turnbuckles: Non-corrosive, of sufficient strength to withstand wind pressure and resulting movement of plant life.
- G. Plant protectors: Rubber sleeves over cable to protect plant stems, trunks, and branches.

PART 3 EXECUTION

3.1 PREPARATION

- A. Layout individual trees and shrubs and areas for multiple plantings. Stake locations and outline areas and secure LANL acceptance before excavation for planting work. Make minor adjustments as may be requested.
- B. Preparation of Planting Soil/Backfill Mix:
 - 1. Before mixing, clean topsoil of roots, plants, clods, stones, clay lumps, and other extraneous materials harmful or toxic to plant growth.
 - 2. Mix specified soil amendments and fertilizers with topsoil at rates specified. Delay mixing of fertilizer if planting will not follow within 2 days.

3.2 PLANTING

- A. Trees
 - 1. Excavate tree pits to a diameter 12 inches greater than the spread of the rootball, and 12 inches deeper than the depth of the rootball.
 - 2. Loosen a minimum depth of 3 inches of subsoil in bottom of pit and mix planting backfill mixture into the loosened subsoil. Place and compact backfill mix in pit to

proper depth so that top of rootball will be 4 inches below surrounding finish grades. On slopes, maintain 4 inches below surrounding grade on the downhill side.

3. Set rootball on compacted backfill mix, plumb tree in center of pit with top of ball 4 inches lower than surrounding grade. Backfill in carefully tamped layers to two-thirds the depth of the rootball and flood with water.
4. After water is absorbed, install 6 fertilizer tablets evenly around perimeter of each tree rootball 6 inches below grade. Continue backfilling and tamping to grade, leaving no voids or air pockets. Water again after placing final layer of backfill.
5. If noted on Drawings, around trees in lawn areas, install edging as shown.
6. Around trees not in planter beds or lawns, form a 4 foot diameter depression 4 inches below surrounding grade with sides neatly sloped inward to top of rootball. On slopes, maintain 4 inches below surrounding grade on the downhill side. Fill depressions with bark mulch.
7. If specified on Drawings, guy or stake tree.

B. Shrub Areas:

1. Final grades of shrub areas and final shrub locations will be approved by LANL prior to shrub pit excavation.
2. Clear shrub areas of rocks, stones larger than 1 inch across and other debris.
3. Place individual shrubs in pits a minimum of 6 inches deeper and 12 inches wider in diameter than the container or ball size. Place plants on compacted backfill layer.
4. Install 3 fertilizer tablets per shrub, when shrub pit is two-thirds backfilled. Place backfill to finish grade level and thoroughly soak.
5. Set top of backfill in shrub areas to allow for mulching.
6. Install plastic liner or weed barriers or filter fabric and mulch as required on Drawings.
7. When not in planting beds, install individual shrubs or small shrub groups with a watering saucer a minimum of 3 inches deeper than adjacent grades on downhill side of saucer and 18 inches wider than the rootball of the shrub or the combined area of the shrub group. Install a minimum of 2 inches of bark mulch in depression. Coordinate watering saucers with the location of bubbler or drip emitter.

C. Ground Cover and Multiple Plant Areas:

1. Loosen subgrade of planting bed areas to a minimum depth of 6 inches. Remove stones larger than 1 inch in any dimension, sticks, stones, rubbish and other extraneous matter.
2. Place approximately 1/2 of total amount of planting soil required. Work into top of loosened subgrade to create a transition layer, then place remainder of the planting soil. Ensure top of planting soil mixture is smooth, level and consistent. Install planting soil mixture to minimum depth required to meet lines, grades and elevations required, after light rolling, natural settlement and depth of mulch.

3. After soil preparation, set out ground cover materials at on center rates specified. Align plants in uniform rectangular pattern or triangular pattern. Excavate pits large enough to set each plant. Backfill with excavated planting soil mix.
4. Water area thoroughly after planting. Fill depressions and level high spots.

D. Planters With Covered Bottom: Exterior Planters

Place a minimum 4 inch layer of 3/4 inch gravel in bottom of planters. Install filter fabric to cover gravel, lap edges by 6 inches at joints and up side of planter. Fill with soil mixture consisting of 1 part topsoil, 1 part coarse sand, and 1 part peat humus. Place soil in lightly compacted layers to an elevation of 1-1/2 inch below top of planter, allowing for natural settlement and 2 inch depth of mulch.

E. Mulch: Provide not less than the following thicknesses of mulch and finish level with adjacent finish grades.

1. Provide a minimum 2 inch thickness of mulch at ground cover and shrub planting bed, unless otherwise noted on Drawings.
2. Provide a minimum 3 inch thickness of mulch at tree pits, unless otherwise noted on Drawings.

F. Apply anti-desiccant using power spray to provide an adequate film over trunks, branches, stems, twigs and foliage according to manufacturer's recommendations. If deciduous trees or shrubs are moved in full leaf, spray with anti desiccant at nursery before moving and again two weeks after planting.

G. Prune, thin out and shape trees and shrubs in accordance with standard horticultural practice. Prune trees to retain required height and spread. Unless otherwise directed by LANL, do not cut tree leaders, and remove only injured or dead branches from flowering trees. Prune shrubs to retain natural character and accomplish their function in the landscape design.

Remove and replace excessively pruned or misformed stock resulting from improper pruning.

3.3 MAINTENANCE

- A. Begin maintenance immediately after planting.
- B. Maintain trees, shrubs and other plants until final acceptance, but in no case less than 60 days after substantial completion of planting.
- C. Maintain trees, shrubs and other plants by pruning to NAA Class 2, cultivating, watering and weeding as required for healthy growth. Restore planting saucers. Tighten and repair stakes, reset trees and shrubs to proper grades or vertical position as required. Spray as required to keep trees and shrubs free of insects and disease.

3.4 CLEANUP AND PROTECTION

- A. During landscape work, keep pavements clean and work area in an orderly condition.
- B. Protect landscape work and materials from damage due to landscape operations, operations by other contractors, trades and trespassers. Maintain protection during installation and maintenance periods. Treat, repair or replace damaged landscape work as directed by LANL.
- C. Upon completion of all planing operations, clean the portion of the project site used for

storing materials and equipment of all debris. Remove all superfluous materials and equipment from the project site. Sweep or wash walks and pavement clean upon completion of work in this section.

3.5 INSPECTION AND ACCEPTANCE

- A. Upon request when landscaping work is completed including maintenance, LANL will make an inspection to determine acceptability of work.
- B. Landscape work may be inspected for acceptance in parts agreeable to LANL providing work offered for inspection is complete including maintenance.
- C. Where inspected landscape work does not comply with requirements, replace rejected work and continue specified maintenance until reinspected by LANL and found to be acceptable. Remove rejected plants and materials promptly from project site.

END OF SECTION